Listing of Claims:

- 1-38. (Cancelled)
- 39. (Currently Amended) A fibrous substrate comprising:

nanoparticles having a surface area of at least about 50 square meters per gram, wherein the nanoparticles are modified with a metal ion and have a negative zeta potential prior to modification with the metal ion, and wherein the zeta potential of the modified nanoparticles is from about -5 millivolts to about -15 millivolts; and

a binder that durably adheres the modified nanoparticles to the substrate.

- 40. (Previously Presented) The substrate of claim 39, wherein the negative zeta potential is from about -1 millivolt to about -50 millivolts.
- 41. (Previously Presented) The substrate of claim 39, wherein the zeta potential of the modified nanoparticles is greater than the zeta potential of the nanoparticles prior to modification.
 - 42. (Cancelled)
- 43. (Previously Presented) The substrate of claim 39, wherein the metal ion is adsorbed onto a surface of the nanoparticles.
- 44. (Previously Presented) The substrate of claim 39, wherein the metal ion forms a coordinate or covalent bond with the nanoparticles.
- 45. (Previously Presented) The substrate of claim 39, wherein the nanoparticles have a surface area of at least about 100 square meters per gram.
- 46. (Previously Presented) The substrate of claim 39, wherein the nanoparticles have a size of less than about 500 nanometers.

- 47. (Previously Presented) The substrate of claim 39, wherein the nanoparticles comprise silica.
- 48. (Previously Presented) The substrate of claim 39, wherein the metal ion includes copper, silver, gold, iron, manganese, or combinations thereof.
- 49. (Previously Presented) The substrate of claim 39, wherein the substrate contains polyolefin fibers.
- 50. (Previously Presented) The substrate of claim 39, wherein the substrate is a spunbond web, meltblown web, or combination thereof.
- 51. (Previously Presented) The substrate of claim 39, wherein the substrate contains cellulosic fibers.
- 52. (Previously Presented) The substrate of claim 39, wherein the modified nanoparticles constitute from about 0.1 to about 10 wt.% of the substrate.
- 53. (Previously Presented) The substrate of claim 39, wherein the binder constitutes from about 0.01 to about 5 wt.% of the substrate.
- 54. (Previously Presented) A personal care product comprising the substrate of claim 39.
- 55. (Previously Presented) Protective barrier clothing comprising the substrate of claim 39.
- 56. (Previously Presented) The substrate of claim 39, wherein the nanoparticles and binder are sequentially applied to the substrate.
 - 57. (Previously Presented) A fibrous substrate comprising:

first nanoparticles having a surface area of at least about 50 square meters per gram, wherein the first nanoparticles are modified with a metal ion and have a negative zeta potential prior to modification with the metal ion; and

second nanoparticles having a positive zeta potential that durably adhere the modified nanoparticles to the substrate.

- 58. (Previously Presented) The substrate of claim 57, wherein the second nanoparticles have a zeta potential of from about 1 millivolt to about 70 millivolts.
- 59. (Previously Presented) The substrate of claim 57, wherein the first nanoparticles have a zeta potential of from about -1 millivolt to about -50 millivolts prior to modification with the metal ion.
- 60. (Previously Presented) The substrate of claim 57, wherein the zeta potential of the modified nanoparticles is greater than the zeta potential of the first nanoparticles prior to modification.
- 61. (Previously Presented) The substrate of claim 60, wherein the zeta potential of the modified particles is from about -5 millivolts to about -15 millivolts.
- 62. (Previously Presented) The substrate of claim 57, wherein the metal ion is adsorbed onto a surface of the first nanoparticles.
- 63. (Previously Presented) The substrate of claim 57, wherein the metal ion forms a coordinate or covalent bond with the first nanoparticles.
- 64. (Previously Presented) The substrate of claim 57, wherein the first nanoparticles have a surface area of at least about 100 square meters per gram.
- 65. (Previously Presented) The substrate of claim 57, wherein the first and second nanoparticles have a size of less than about 500 nanometers.

- 66. (Previously Presented) The substrate of claim 57, wherein the first nanoparticles comprise silica.
- 67. (Previously Presented) The substrate of claim 57, wherein the second nanoparticles comprise alumina.
- '68. (Previously Presented) The substrate of claim 67, wherein the alumina is coated onto silica.
- 69. (Previously Presented) The substrate of claim 57, wherein the metal ion includes copper, silver, gold, iron, manganese, or combinations thereof.
- 70. (Previously Presented) The substrate of claim 57, wherein the substrate contains polyolefin fibers.
- 71. (Previously Presented) The substrate of claim 57, wherein the substrate is a spunbond web, meltblown web, or combination thereof.
- 72. (Previously Presented) The substrate of claim 57, wherein the substrate contains cellulosic fibers.
- 73. (Previously Presented) The substrate of claim 57, wherein the modified nanoparticles constitute from about 0.1 to about 10 wt.% of the substrate.
- 74. (Previously Presented) A personal care product comprising the substrate of claim 57.
- 75. (Previously Presented) Protective barrier clothing comprising the substrate of claim 57.